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January 12, 2015

Mr. Jason Gunter
Remedial Project Manager
U.S. Environmental Protection Agency
Region 7 - Superfund Branch
11201 Renner Blvd.
Lenexa, KS 66219

Re: The Doe Run Company – Rivermines Mine Tailings Site Surface Water Management Plan

Dear Mr. Gunter:

Enclosed is a plan that The Doe Run Company (Doe Run) intends to implement to reduce surface water infiltration at the Rivermines Mine Tailings Site. The focus of this plan is to reduce surface water infiltration into the tailings that contribute to and result in seepage from the toe of the slopes. If you have any questions or comments, please call me at 573-638-5020 or Kevin James at 573-626-2096.

Sincerely,

Ty L. Morris, P.E., R.G.
Vice President

TLM/jms
Encl.
c: Kevin James, TDRC
Mark Yingling, TDRC (electronic only)
Michael Montgomery, TDRC (electronic only)
Chris Neaville, TDRC (electronic only)
Brandon Wiles, MDNR

07CR

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Elvins/Rivermines Mine Tailings Site
Surface Water Management Plan
Response to Comments

The *Surface Water Management Plan* for the Elvins/Rivermines Mine Tailings Site, Leadwood, Missouri was prepared for The Doe Run Company by Barr Engineering Co. as a draft in October 2014. This document was revised to address comments made by the U. S. Environmental Protection Agency (EPA), Region VII and the Missouri Department of Natural Resources (MDNR). A description of the revisions is provided below to assist EPA and MDNR in their review of the revised document.

Comment Number	Response to Comment
EPA Comments	
Specific Comment 1	To address this comment, the text of the first sentence of the first paragraph of Section 1.3.5.5 was modified.
Specific Comment 2	To address this comment, the text of the first sentence of the second paragraph of Section 1.3.5.5 was modified.
Specific Comment 3	To address this comment, the text of the first two paragraphs of Section 2.0 was modified.
Specific Comment 4	To address this comment, the text of the third paragraph of Section 4.0 was modified. Section 4.0 was modified since Section 3.0 was added to the plan.
General Comment 1	Section 3.0 was modified to discuss the schedule of the work. The previous Section 3.0 is now Section 4.0 and the previous Section 4.0 is now Section 5.0.
MDNR Comments	
1	To address this comment, Section 3.0 was modified to discuss the schedule of the work. The previous Section 3.0 is now Section 4.0 and the previous Section 4.0 is now Section 5.0.
2	To address this comment, the referenced sentence in Section 2.0 was modified to eliminate confusion and correspond to Section 1.1.
3	To address this comment, text was added to the first paragraph of Section 2.1.2.
4	To address this comment, text was added to the first paragraph of Section 2.1.2.
5	To address this comment, text was added to the first paragraph of Section 2.1.2.

Hopefully, the above table will help in the review of the revised document. If you have any questions or require clarification of any of the responses, please call Kevin James at 573-626-2096.

BARR

Surface Water Management Plan

Elvins/Rivermines Mine Tailings Site

Prepared for
The Doe Run Company

January 2015

Surface Water Management Plan

Elvins/Rivermines Mine Tailings Site

Prepared for
The Doe Run Company

January 2015

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Jefferson City, MO 65109
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Surface Water Management Plan

January 2015

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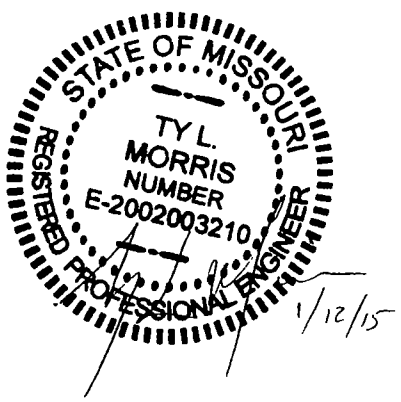


1.0 Background

1.1 Site Description

The Elvins/Rivermines Tailings Site is located in an area known as the Old Lead Belt. The Old Lead Belt is located in St. Francois County in southeastern Missouri and covers an area of approximately 110 square miles. The site can be located on the Flat River 7 ½-Minute USGS quadrangle map in the East ½ Section 12, Township 36 North, Range 4 East and the South Half Section 7, Township 36 North, Range 5 East. The site is located approximately at Latitude 37° 50' 30" and Longitude 90° 32' (see Figure 1). The facility occupies approximately 300 acres and is located west of State Highway 32 between the former communities of Elvins and Rivermines, Missouri. These communities are now part of the City of Park Hills, Missouri. Tailings and chat covered approximately 130 acres of the site at the start of removal action activities. The remaining area is wooded or part of the Lead Belt Materials Company's (LBM Co.) quarry and bituminous mix operations (Barr, 2003)

1.2 History of Mining/Milling Operations

The Rivermines Site is the result of mining operations and stockpiling of milling wastes from the early 1890s. Early operations included mining, milling at numerous locations, roasting, and smelting. Ownership consolidation occurred and by 1909 milling operations had been consolidated to one site. Ore fed to the Rivermines mill was from multiple mines in nearby locations. Ore was hauled to the mill from remote locations by rail, aboveground (early) and underground (later). The mill was modernized and enlarged on occasion until it was permanently closed in approximately 1940. LBM Co. currently leases portions of the site and owns an adjacent quarry. LBM Co. also uses chat from the site as aggregate in some of their bituminous mixes (Barr, 2003).

1.3 Summary of Removal Activities Completed to Date

The Rivermines Mine Tailings Site was divided into five areas. These areas were the Chat Pile Area, the Spillway Area, the Tailings Area, the Trackside and Streamside Area, and the Lead Belt Materials Operation Area (LBMOA). The removal action activities completed for the previously referenced areas were completed in accordance with the *Removal Action Work Plan* (RAWP)(Barr, 2005a) Construction Drawings (Barr, 2005b), and Specifications (Barr, 2005c) and a summary of the actions are listed below.

1.3.1 Chat Pile Area

The chat pile was located on the eastern portion of the site between the southeast section of the Tailings Area and the LBM Co. entrance road. The main focus of the work on the chat pile was to regrade the slopes and reduce the top elevation.

Prior to starting construction activities on the chat pile, the areas that were to be covered by extending the slopes were cleared, grubbed, and stripped to establish an appropriate foundation. The materials stripped that were identified as miscellaneous fill (Specification 02300) during these activities were placed in the disposal area north of the LBM Co. entrance road. Materials found to meet the requirements for general fill (Specification 02300) were used as general fill around the site. Materials found to meet the

requirements of slope fill (Specification 02300) were used in the construction of the regraded chat pile slopes.

Work on the chat pile included removing all material above approximately Elevation 890. This material was used as fill in the regrading activities completed around the site. Work on the chat pile also included regrading the east and south slopes of the pile to a 3H:1V gradient. The finished slopes and top of the chat pile were covered with a minimum of 12 inches of slope protection rock.

Prior to extending the east slope of the chat pile, two underdrains were constructed. These drains, one on the north side of the south decant discharge culvert and the other at the low point of the valley in the Spillway Area, were constructed to capture seepage from the existing toe. The water captured by these seep drains is discharged into the seep pond located at the toe of the chat pile spillway. The alignment and specific details of these seep drains are shown on the Record Drawings.

No work was completed on the west slope of the chat pile. This portion of the chat pile was left open so that LBM Co. could continue to excavate material from the chat pile for use in their bituminous plant.

1.3.2 Tailings Area

The Tailings Area is the relatively flat approximately 70-acre area located on the northern portion of the site. The area is surrounded by woods on the north, east, and west sides; by the LBMOA on the south; and the chat pile on the southeast corner. The Tailings Area was divided into the Upper Tailings Area and the Lower Tailings Area. The main focus of the work on the Tailings Area was to buttress the slopes on the east, west, and south sides and regrade the top to direct stormwater runoff through the existing decant structures.

1.3.2.1 West Slope

The west slope of the Tailings Area extends from Station 0+00 to approximately Station 10+25. The main focus of the removal action activities on this area was to extend the crest and toe of the slope to buttress the exposed slimes layers for improved slope stability.

Prior to starting construction activities on the west slope, the base of the areas to be buttressed were cleared, grubbed, and stripped to establish an appropriate foundation for the buttressing materials. In addition, in areas where slimes were present, the slimes were excavated 100 feet back from the face of the final slope. The stripped materials identified as miscellaneous fill (Specification 02300) were placed in the disposal area north of the LBM Co. entrance road. Materials found to meet the requirements for general fill (Specification 02300) were used as general fill around the site. Work on the west slope adjusted the elevation of the crest to facilitate the grading plan for the lower and Upper Tailings Area. This included: regrading the crest of the slope between Stations 0+00 and 4+20 to an elevation of 935; adjusting the alignment between Stations 4+20 and 6+00 to the west to facilitate buttressing and transition from Elevation 935 to Elevation 927 to accommodate the elevation differences between the regraded Upper and Lower Tailings Areas; and adjusting the alignment between Stations 6+00 and 10+25 to the west to facilitate buttressing and constructing the crest at Elevation 927 to accommodate the grading plan of the Lower Tailings Area.

The west slope was constructed with slope fill (Specification 02300) in compacted lifts from the toe upwards to the estimated top of slimes at approximately Elevation 900. Above this elevation there were no compaction requirements for the slope fill. This slope was constructed with a 20-foot wide crest that drains inward at a five percent grade, an inner slope gradient of 4H:1V and an outer slope gradient of 3H:1V. This slope, as well as the crest, was covered with a minimum of 12 inches of slope protection rock.

As part of the buttressing process, an underdrain was constructed between approximately Stations 2+50 and 4+00 in the west tailings area slope buttress. The granular drain was constructed following a modified drainage path through the extended toe of the regraded outer slope. The alignment and specific details of this seep drain is shown on the Record Drawings.

A swale to divert run-on and carry the runoff from the north decant tower discharge pipe and the seep was constructed west of the toe of the west tailings area slope. This channel discharges to the north LBMOA detention pond, located between the LBM Co. bituminous plant and quarry.

1.3.2.2 South Slope

The south slope of the Tailings Area extends from approximately Station 10+25 to approximately Station 24+15. The main focus of the removal action activities on this area was to extend the crest and toe of the slope to buttress the exposed slimes layers for improved slope stability.

Work on the south slope adjusted the elevation of the crest to facilitate the grading plan for the Lower Tailings Area. This included establishing a slope crest between approximately Stations 10+25 and 19+15 and lowering the crest between approximately Stations 19+15 and 24+15 to an elevation of 927, following the original alignment of the slope crest. The south slope east of Station 24+15 was rough graded to provide a slope with an approximate gradient of 3H:1V and a minimum crest elevation of 927. This portion of the south slope is adjacent to the portion of the chat pile that was left uncovered for use in the LBM Co. bituminous plant operations. This slope, which was constructed with slope fill (Specification 02300), was constructed with a 20-foot wide crest that drains inward at five percent, an inner slope gradient of 4H:1V, and an outer slope gradient of 3H:1V. These slopes, as well as the crest, were covered with a minimum of 12 inches of slope protection rock.

Work on the south slope was also completed on the area between Stations 10+00 and 15+00 where the existing slope had been excavated as part of the LBM Co. agriculture lime sales. At this location, miscellaneous fill (Specification 02300) was used to fill the portion of the excavation below Elevation 915 and at least 50 feet back from a line that, when extended to the surface of the Lower Tailings Area, would intersect the toe of the inner slope of the crest. To buttress this material, a 50-foot wide area of general fill was placed on the south side of the miscellaneous fill. This area was buttressed with slope fill during the construction of the south slope. The remainder of the excavation above Elevation 915 was filled with general fill.

1.3.2.3 East Slope

The east slope of the Tailings Area extends from about Station 35+50 to approximately Station 50+50 plus. The main focus of the construction activities on this area was to extend the crest and toe of the slope to buttress the exposed slimes layers for improved slope stability.

Prior to starting construction activities on the east slope, the base of the areas to be buttressed were cleared, grubbed, and stripped to establish an appropriate foundation for the buttressing materials. These activities were completed from 25 feet inside the proposed toe of slope location to the limit of unvegetated tailings beyond the toe of the proposed slope. Stripped materials identified as miscellaneous fill (Specification 02300) were used to fill the agriculture lime excavation area described in Section 1.3.2.2 or in the disposal area north of the LBM Co. entrance road. Materials that met the requirements for general fill (Specification 02300) were utilized for general fill around the site. These materials were placed in the portion of the east slope below the area of visible slimes provided that a minimum 25-foot width of slope fill was maintained on the outer slope.

Work on this slope included regrading the crest of the slope to an approximate elevation of 935. South of Station 37+60 the crest continued the alignment established as part of regrading the chat pile. Between Stations 37+60 and Station 50+50, the crest alignment was relocated to the northeast of the preconstruction crest location as much as 250 feet. North of Station 50+50 this crest was blended into the existing ground contours consistent with the regrading plan for the Upper Tailings Area. The slope was constructed with a 20-foot width that drains inward at five percent, an inner slope gradient of 4H:1V, and an outer slope gradient of 3H:1V. These slopes, as well as the crest, were covered with a minimum of 12 inches of slope protection rock.

1.3.2.4 Lower Tailings Area

The portion of the Tailings Area identified as the Lower Tailings Area was the large depression created by LBM Co. during the sale of agricultural lime, the former access road area directly west of the depression, and the area between the depression and the chat pile including the south decant tower. The main focus of the grading activities on the Lower Tailings Area was to promote drainage to a normally dry detention basin constructed west of where the south decant tower was located.

The Lower Tailings Area was graded to drain from west to east at a 0.5 percent gradient. To avoid excavating into the slimes layer encountered during the investigation near the south decant tower, an elevation of 918 was set for the inlet of the surface water discharge structure on the east side of this area to collect the surface water runoff from this area. Once grading activities were completed, this area was covered with a minimum of 6 inches of cover soil, seeded and fertilized.

As part of the grading activities on the Lower Tailings Area, a slope, identified as the lower interior slope, was constructed along the north and east edge of the Lower Tailings Area to transition between the elevation differences of the Lower Tailings Area and the Upper Tailings Area. This slope was constructed with a 20-foot wide crest that drains toward the Upper Tailings Area at five percent and side slopes with a 4H:1V gradient. The crest and slopes of the lower interior slope were covered with a minimum 12 inches of slope protection rock.

As described above, a stormwater detention pond was constructed in the southeast portion of the Lower Tailings Area to accommodate runoff from the Lower Tailings Area and the south half of the Upper Tailings Area. The detention pond has a discharge elevation of 918.0. As part of the removal action activities on the Lower Tailings Area, a surface water discharge structure was constructed. This structure, a concrete manhole, was installed so that runoff from the area will pass through the detention basin, enter the structure, travel through the 12-inch HDPE pipe that was attached to the inlet structure, and be discharged at the toe of the regraded south slope near Station 24+50.

As part of the engineering evaluation/cost analysis (EE/CA) investigation, the south decant tower and the south decant tower outlet were inspected. This inspection identified a debris blockage in the tower approximately 7 to 10 feet above the base of the tower. Further inspection of the structure during the removal action activities identified that this debris could not be safely removed, so the tower was closed. This was completed by demolishing the portion of the tower that was exposed in the Lower Tailings Area. The demolition debris was put in the tower and then covered with cover soil. In addition, the outlet of the structure was blocked with a metal grate that was attached to the existing concrete structure. This allowed for the outlet to continue discharging water as needed, while preventing access.

1.3.2.5 Upper Tailings Area

The remainder of the top of the Tailings Area is identified as the Upper Tailings Area. Due to the large size of the Upper Tailings Area and the relatively small elevation difference between the north and south ends of this area, the Upper Tailings Area was divided into two separate areas. The main focus of the grading activities on the Upper Tailings Area was to promote drainage to discharge locations on the north and south end of the Tailings Area.

Removal action activities for this area regraded the northern portion of the Upper Tailings Area to drain towards the north decant tower. This included regrading the portions of this area to the south and west of the stormwater detention pond to a gradient of 0.5 percent. This also included regrading the area east of the detention pond (north of Station 50+50). However, as this area already had a fairly consistent gradient, grade work in this area was only completed to level out areas that did not match the existing gradient and blend into the 0.5 percent gradient in the rest of the Upper Tailings Area. To avoid areas near the pond that were too soft for equipment to work safely, grading activities were halted as much as 100 feet from the normal pool elevation of the pond. The regraded top of the Upper Tailings Area was covered with a minimum of 6 inches of cover soil, seeded, and fertilized.

Regrading activities on the Tailings Area were also completed on the south half of the Upper Tailings Area. These activities focused on grading this area from the east slope towards the letdown between the Upper and Lower Tailings Area at a gradient of about 1.0 percent. The letdown, which directs the drainage from this area to the west end of the Lower Tailings Area, was constructed with a gradient of 0.5 percent.

To better promote drainage in the Upper Tailings Area, a drainage break between the north and south halves of the area was constructed. This drainage break extends for the crest of the east slope near Station 49+50 to the crest of the west slope near Station 4+20. This drainage break, identified as the

upper interior slope, was constructed with a flat 20-foot wide crest at Elevation 935 and side slopes with a 4H:1V gradient. The crest and both slopes were covered with a minimum of 12 inches of slope protection rock.

1.3.3 Spillway Area

The spillway is the area located on the eastern portion of the site between the chat pile and Old Highway 32. The main focus of the work on the Spillway Area was to strip this area to natural ground to eliminate the potential for leaching of discharge water through tailings.

Prior to starting construction activities in the spillway, the tailings were stripped to natural ground to establish an appropriate foundation for extending the chat pile slopes and constructing the sedimentation ponds. This included the old railroad grade that extended from the northeast corner of the Spillway Area to the LBM Co. entrance road. Miscellaneous fill (Specification 02300) encountered during the stripping was placed in the onsite disposal area north of the LBM Co. entrance road. Materials found to meet the requirements for general fill (Specification 02300) were used as general fill around the site. Materials found to meet the requirements of slope fill (Specification 02300) may be used in the construction of the regraded chat pile slopes.

Upon completing stripping activities in the spillway, work was completed to construct a passive treatment system for water seeping from the chat pile. This included a seep collection pond, two treatment cells, berms to divert surface water runoff from mingling with the seep water, and a piping system to convey the water through the system. The berms and the ponds were constructed out of clay fill obtained onsite. The portion of the railroad grade between the Spillway Area and the LBM Co. entrance road was stripped to natural ground, regraded to drain towards the spillway, and covered with 12 inches of slope protection rock.

1.3.4 Trackside and Streamside Tailings Areas

Removal action activities were also completed on two areas located east of Old Highway 32 identified as the Trackside Tailings Area and the Streamside Tailings Area. The main focus of the removal action activities in these areas was to excavate as much of the tailings in these areas as is feasible with the existing conditions (buried communication lines, active railroad lines, etc.) and return the material to the site.

1.3.4.1 Trackside Tailings Area

The area identified as the Trackside Tailings Area is located east of the spillway between Old Highway 32 and the Union Pacific rail lines. The work on this area focused on stripping tailings from the area between Old Highway 32 and the active rail line, as well as the demolition of several concrete structures. The material stripped from this area, along with the demolition debris, was considered miscellaneous fill (Specification 02300) and placed in the disposal area north of the LBM Co. entrance road.

As part of these stripping activities, the area was graded to drain away from the active rail line and Old Highway 32 toward a natural swale discovered when the tailings were removed. The west half of this

swale was graded to drain to the west towards the drainage structure that channels the unnamed tributary of Flat River from the site under Old Highway 32 and the railroad to the Streamside Tailings Area. The east half of this swale was graded to drain to the east towards a concrete culvert that carries water under the railroad tracks. Upon the completion of stripping activities, a minimum of 6 inches of cover soil was placed over the area, seeded, and fertilized.

It should be noted that the stripping activities were conducted in a manner that avoided damaging or moving the telecommunication lines, the City of Park Hills water line buried along Old Highway 32, and reducing the stability of the utility poles and associated electric and cable lines. The tailings left in place near these lines were covered with a minimum of 6 inches of cover soil or filter rock. The filter rock, which was placed 6-foot wide under the power lines parallel to Old Highway 32, was requested by the City of Park Hills so that they could construct a sidewalk along this road.

1.3.4.2 Streamside Tailings Area

The area identified as the Streamside Tailings Area is located east of the Spillway Area between the Union Pacific rail lines and Flat River. The work on this area focused on stripping tailings from the area. The material stripped from this area, along with the demolition debris, was considered miscellaneous fill (Specification 02300) and placed in the disposal area north of the LBM Co. entrance road.

Removal action activities for this area stripped the area between the rail lines and Flat River to natural ground while maintaining the channel of the unnamed tributary to Flat River. As part of this activity, the area was graded to drain towards the unnamed tributary at a relatively flat gradient. Upon the completion of stripping activities, a minimum of 6 inches of cover soil was placed over the area, seeded, and fertilized. It should be noted that the grading activities were conducted in a manner that avoided damaging the city water line that runs from north to south across the western side of the area.

1.3.5 Lead Belt Materials Co. Operations Area (LBMOA)

The LBMOA is located on the southern portion of the site. This area is the portion of the site that is leased by LBM Co. from Doe Run. The LBMOA includes the former stockpile area south of the LBM Co. entrance road, the portion of the abandoned mine/mill structures not included in the LBM Co. office shop area, the LBM Co. office/shop area, a large portion of the active quarry, the area occupied by bituminous plant operations and the chat conveyor, the area between the LBM Co. entrance road and the chat conveyor that will be utilized as an onsite disposal area, and the ponds located between the quarry and the bituminous plant. For the purposes of this discussion, the small area located south of the chat pile identified as the depressed railroad grade area will also be included in the LBMOA. The focus of work in the LBMOA was to strip tailings from the areas south of the LBM Co. entrance road, demolish the remaining mine/mill structures, construct stormwater control structures, and cover as much of the area between the bituminous plant and the chat pile with blasted quarry rock as possible.

1.3.5.1 Areas South of the LBM Co. Entrance Road

This portion of the LBMOA includes the former stockpile area located on the southern edge of the site. This area is bounded by a residential neighborhood to the south and east, the LBM Co. entrance road to

the north, and the former mine/mill structures to the west. Doe Run utilized this area for office/shop facilities and laydown area for their equipment. Removal action activities on this area focused on stripping the area to natural ground and grading it to drain towards a drainage channel constructed on the south side of the LBM Co. entrance road. A new 18-inch corrugated metal culvert was installed at the east end of the new channel to transfer water under the LBM Co. entrance road to a new channel constructed on the north side of the LBM Co. entrance road that runs along the toe of the chat pile from the LBM Co. entrance road to the Spillway Area. Upon completion of the activities in this area, the area was covered with a minimum of 6 inches of cover soil, seeded and fertilized.

Removal action activities in the LBMOA were also completed on the south side of the LBM Co. entrance road in the area identified as the depressed railroad grade area. Samples taken from this area during the EE/CA investigation indicated the presence of contamination. Removal action activities on this area included stripping the contaminated soil and testing the soil to verify that the soil had been removed. The materials stripped from this area were placed in the disposal area north of the LBM Co. entrance road. Upon completion of the grading activities, this area was seeded and fertilized.

1.3.5.2 Demolition of Mine/Mill Structures

To the west of the former stockpile area was the abandoned mine/mill structures. The area where these structures were located is split by the road to the LBM Co. office and shop area. This area is bordered on the south by the LBM Co. office/shop area and a residential neighborhood, to the east by the former stockpile area, on the north by the LBM Co. entrance road and a site haul road, and to the west by the LBM Co. quarry.

Removal action activities on the area east of the road to the LBM Co. offices included demolition of all the former mine/mill structures in this area. Demolition activities took the structures down to a minimum of 2 feet below the natural ground surface. Any portions of the structures that extended deeper than 2 feet below the natural ground surface were left in place and covered with soil. All demolition debris was placed in the disposal area north of the LBM Co. entrance road. Once the demolition activities were completed, this area was stripped to natural ground and graded to drain towards the drainage channel constructed on the south side of the LBM Co. entrance road. Materials stripped from this area were placed in the disposal area north of the LBM Co. entrance road. Upon completion of the grading activities, the stripped areas were covered with a minimum of 6 inches of cover soil, seeded, and fertilized.

Removal action activities on the area west of the road to the LBM Co. offices included demolition of all the former mine/mill structures not currently being used by LBM Co. for their office and shop facilities. As there were some safety concerns about the demolition of some of the structures in this area, demolition activities were only completed on the portions of the remaining structures that could be safely accessed. The typical demolition activities in this area took the structures down to a minimum of 2 feet below the natural ground surface. Any portions of the structures that extended deeper than 2 feet below the natural ground surface were left in place and covered with soil. In instances where it was not feasible to remove the structures due to safety concerns, demolition activities were completed to demolish as much of the structure as is possible. The remaining portion of the structure was buried in place and covered with soil. All demolition debris was placed in the disposal area north of the LBM Co. entrance road. Once

demolition activities in this area were completed, this area was stripped to natural ground and graded to drain towards the drainage channel constructed on the south side of the LBM Co. entrance road. Materials stripped from this area were placed in the disposal area north of the LBM Co. entrance road. Upon completion of the grading activities, the stripped areas were covered with a minimum of 6 inches of cover soil, seeded, and fertilized.

1.3.5.3 Chat Conveyor Corridor

Prior to the start of the removal action activities, LBM Co. utilized a conveyor to transport chat from the west slope of the chat pile to the bituminous plant. During the initial portion of the removal action activities, this conveyor continued to operate. However, as the removal action activities continued, it was decided that this piece of equipment would be removed, and LBM Co. would haul chat by truck to a stockpile located near the bituminous plant. Once the conveyor was removed, all of the material in the area where this conveyor had been located that met the specifications for slope fill was removed and used in the construction of the south and west slopes of the Tailings Area. Once all of slope fill that could be utilized from this area was removed, the portion of the area that had been affected by the removal action activities was covered with a minimum of 12 inches of slope protection rock, except for a haul road from the bituminous plant to the west side of the chat pile that was left in place for LBM Co.

1.3.5.4 Disposal Area

As work was completed around the site, materials identified as miscellaneous fill (Specification 02300) were placed in an onsite disposal area located on the north side of the LBM Co. entrance road. Disposal activities took advantage of the excavated portions of this area as well as increased the elevation of this area. The disposal area was constructed with a maximum side slope gradient of 3H:1V and a minimum top gradient of 2.0 percent. Once the miscellaneous fill was placed in the disposal area, the entire disposal area was regraded and covered with a minimum of 12 inches of slope fill (Specification 02300). This layer was then covered with a minimum of 12 inches of slope protection rock.

1.3.5.5 Stormwater Control Structures

Work in the LBMOA also included the construction or improvement of a series of stormwater control structures (channels, culverts, and ponds). These structures were built to manage the stormwater runoff from the 100-year, 24-hour rainfall event in an erosion free manner without overtopping the existing roadways within the site and LBM Co. operations areas.

As described earlier, stormwater from the pond on the north end of the Upper Tailings Area was routed to discharge from the Upper Tailings Area through the north decant tower. Starting at the discharge, a channel was constructed west of the toe of the west tailings area slope. This channel carries the discharge from the north decant tower, as well as run-on from the drainage area to the northwest of the Tailings Area to the north detention pond in the LBMOA. This pond was modified slightly to reduce the normal water level, which brought the normal water level away from the toe of the west tailings area slope. The outlet of this pond is a 12-inch corrugated metal culvert, which was installed during the removal action activities, that discharges water into the south detention pond.

Removal action activities were also completed on the south detention pond. These activities included grading the northeast side to improve storage and remove sediment that had run into the pond as part of the LBM Co. operations. The outlet for this pond is a 36-inch corrugated metal culvert with no gradient under the haul road between the LBM Co. office and the bituminous plant. This culvert discharges to the newly constructed pond to the east of this road near the former mine/mill structures.

The area between the former mine/mill structures and the LBM Co. entrance road was regraded to construct a stormwater detention pond. This pond had a flat gradient and was constructed at the same elevation as the normal pond elevation of the south detention pond. At the east end of this pond, a 24-inch corrugated metal culvert was installed under the LBM Co. entrance road to connect with a concrete culvert located on the north side of the LBM Co. entrance road. This concrete culvert, which was part of the former milling operation, was evaluated during the removal action activities and found to be intact and capable of continued use. The concrete culvert, which runs parallel to the LBM Co. entrance road, discharges into the newly constructed channel on the north side of the LBM Co. entrance road, which runs along the toe of the chat pile from the LBM Co. entrance road to the Spillway Area. As part of the removal action activities, a metal grate was attached to the outlet of the concrete pipe to restrict access to the pipe.

2.0 Supplemental Removal Measures for Surface Water Quality Improvement

This section of the report describes additional, supplemental remedial measures that are intended to be implemented to minimize the volume and improve the water quality discharging from the Rivermines Mine Tailings Site. The site has an area of approximately 130 acres and is located in the upper reaches of the Flat River Watershed (HUC 071401040108). During certain runoff conditions, the site receives a certain volume of surface water flow from offsite areas that is primarily captured in a stormwater pond on the surface of the Tailings Area and routed through the north decant tower. Based on the contours shown on the 1905 USGS map, depicted on Figure 4 of the EE/CA (Barr, 2003), it is likely that this additional run-on volume of water contributes to saturated tailings and the phreatic water surface of the tailings basin, which contributes to seeps at the toe of the Tailings Area slopes.

Precipitation that falls on the southern two-thirds of the Tailings Area is collected and routed through a pipe that discharges near the western slope of the Chat Pile Area where LBM Co. is continuing to mine chat for their usage in the production of asphalt as agreed to by EPA. Based on the discharge location of this water, in comparison to the seep ponds, the coarse-grained nature of the chat, and the contours shown on the 1905 USGS map, depicted on Figure 4 of the EE/CA (Barr, 2003), it is believed that this discharge water contributes significant flow to the seep ponds, located downstream of the chat pile.

Doe Run is planning the implementation of additional removal measures that are intended to reduce and better manage the run-on and infiltration of stormwater into and on the chat/tailings area(s). This additional surface water contributes to zinc-containing seepage from the toe of the chat/tailings pile. The seepage at the toe of the chat/tailings pile and the discharge of the west biocell will be monitored to evaluate the effect that the supplemental measures have on flow volumes and the performance of the west biocell.

The remedial measures are segregated into the Upper Tailings Area and the Lower Tailings Area.

2.1 Upper Tailings Area

2.1.1 North Decant Tower

The existing decant tower, installed during the operation of the facility, was incorporated into the removal action activities to be used to convey stormwater that collects on the surface of the north portion of the Upper Tailings Area to the area identified as the north LBMOA detention pond. The historic knowledge of the condition of this structure is limited; however, observations have identified potential structural defects of the horizontal pipe. It is believed that these defects have the potential to provide a preferential flow path that allows surface water direct communication with the tailings which could contribute to the seeps at the toe of the Tailings Area slopes.

As part of the supplemental work, the remaining aboveground portion of the vertical tower will be removed. The lower 3 feet of the tower will be filled with quarry rock. The remaining portion of the tower will be filled with a minimum of 10 feet of concrete and then capped with low permeability soil, as

defined in the approved Specifications (Barr, 2005c), to an elevation that blends into the final contours of the area. At this time, the horizontal pipe, which is located at the base of the vertical tower, will remain open to allow existing water in the tailings to drain. In the future, the horizontal pipe component of the tower may be pressure grouted and sealed once drainage has significantly slowed or ceased.

2.1.2 Grading and Surface Water Collection Channel

Run-on from the area north of the tailings basin is proposed to be diverted from the tailings surrounding the north decant tower via the installation of a channel and a diversion berm as shown on Construction Drawings C-10A and C-10B. Currently, the runoff from this offsite area runs onto the tailings basin, collects in the pond, and flows through the North Decant Tower to the northern LBMOA detention pond (Construction Drawing C-10B). The swale and berm will divert runoff around the tailings basin. This swale will also receive surface water that collects in the pond that would have previously been discharged through the North Decant Tower. The swale will then convey the water to the area beyond the toe of the western slope of the Tailings Area. From the discharge of the swale, water will flow overland down the slope at the toe of the western slope of the Tailings Area to the north LBMOA detention pond. The swale will be constructed in both native soil and tailings. Any visible tailings and chat removed during the construction of the swale will be utilized to promote drainage in the area currently covered by the pond, or disposed of within the current Tailings Area. Excavated native soils will be utilized to construct the side slopes of the swale. Once the swale has been constructed, it will be covered with a 6-inch layer of filter rock, which will be covered by a 12-inch layer of Type 2 riprap as shown on Construction Drawing C-10B and described in the approved Specifications (Barr, 2005c). Clearing and grubbing activities will be completed during the construction of this swale and berm on an as-needed basis. Any vegetation, i.e. trees and brush, cleared during the completion of this work will be burned using an air curtain destructor in accordance with applicable state, federal, local regulations.

The current outlet of the northern LBMOA pond is a corrugated metal culvert. As part of this project (with the permission of LBM Co.) , the pipe will be removed and a swale will be constructed between the north LBMOA detention pond and the south LBMOA detention pond, as shown on Construction Drawing C-10C. The haul road that crosses over top of the culvert in this area will be reconstructed to have a low water crossing instead of a culvert.

2.1.3 South LBMOA Detention Pond

LBM Co. operates an asphalt production facility adjacent to the southern slope of the Tailings Area. Discharges of process water from the asphalt production facility are routed to the southern LBMOA detention pond and mixed with the water coming from the north LBMOA pond before being discharged.

Seepage from this pond has the potential to impact the seep pond in the Spillway Area. Historical information indicates that the south LBMOA detention pond was not constructed with a low permeability soil liner. As part of this work, Doe Run intends (with the permission of LBM Co.) to construct a swale across the south LBMOA detention pond from the north LBMOA detention pond to the existing culvert on the downstream side of the south LBMOA detention pond (Construction Drawing C-10C). This swale, as well as the side slopes of the swale, will be lined with cover soil, as described in the approved

Specifications (Barr, 2005c). The portion of the south LBMOA detention pond to the south of this swale will be filled to match into and expand the existing LBM Co. stockpile area adjacent to their asphalt plant. The portion of the south LBMOA detention pond to the north of this swale will be graded to drain towards the swale. This area will also be covered with 12 inches of cover soil, as described in the approved Specifications (Barr, 2005c). Once the swale has been constructed, it will be covered with a 6-inch layer of filter rock that will be covered by a 12-inch layer of Type 2 riprap as shown on Construction Drawing C-10C and described in the approved Specifications (Barr, 2005c).

2.2 Lower Tailings Area

The South Decant Tower was abandoned and replaced with a new surface water inlet structure during the initial removal action activities at the site. The southern two-thirds of the Tailings Area, which was covered with low permeability soil, was graded to drain to the surface water structure that was constructed to replace the South Decant Tower. The structure consists of a concrete manhole with a 12-inch opening that drains collected surface water to a 12-inch diameter HDPE discharge pipe. This pipe is routed to the south and discharges at the toe of the southern Tailings Slope, near Station 24+50, immediately upstream of the working face of the area where LBM Co. currently removes chat from the west side of the chat pile. This area is located approximately 700 feet up gradient of the seep pond. The surface water collecting in this area has the potential to migrate down gradient and impact the volume and concentration of water collected in the seep pond.

The pipe that conveys water from the Tailings Area is proposed to be rerouted to the east side of the chat pile to an area that drains away from the eastern toe of the slope of the chat pile. This work will consist of installing a 24-inch diameter corrugated plastic pipe in a trench that is a minimum of 3 feet deep. This pipe will be constructed in accordance with Construction Drawings C-10A and C-10D. Once in place the slope will be graded back to the final subgrade contours shown on the approved Construction Drawings and covered with 12 inches of blasted quarry rock as described in the approved RAWP (Barr, 2005a) and Specifications (Barr, 2005c). At the downstream end of the pipe, rock will be placed to dissipate the energy of the water exiting the pipe. The area to be covered with rock will be approximately 10 feet wide and will extend approximately 30 feet from the downstream end of the pipe. The rock to be placed in this area will consist of a 30-inch layer of Type 4 riprap underlain with a 12-inch layer of riprap bedding. The riprap bedding will meet the gradation described in the approved Specifications (Barr, 2005c). The Type 4 riprap will consist of materials with a predominate rock size of 19 inches, 100 percent (by weight) of the material passing the 28-inch sieve, and 0 to 15 percent (by weight) of the material passing the 6-inch sieve.

In addition to the installation of the 24-inch CPP, this work will construct a small berm at the toe of the south slope. This berm, shown on Construction Drawing C-10D, will be used to divert the water that is discharged from the new 24-inch CPP away from the inlet of the seep pond used to collect water seeping out of the toe of the chat pile. This berm, which will be constructed immediately south and east of the South Decant Discharge, will be constructed of material meeting the definition of cover soil, as described it the approved Specifications (Barr, 2005c). The upstream side of this berm will be covered with a 12-inch layer of Type 2 riprap, as described in the approved Specifications (Barr, 2005c).

2.3 Additional Measures

In 2011, Doe Run installed a pilot scale biocell reactor to monitor the treatment efficiency of a certain biological media mixture that was selected based upon bench scale testing. Monitoring of the pilot scale biocell has continued since installation. The results of the pilot test have indicated that the biocell is capable of significant zinc reduction in the effluent from the seep pond during warm weather periods of the year. Figure 2 illustrates the reduction and cyclical performance of the pilot biocell. As evidenced in Figure 2, which is based upon data collected since 2011, zinc removal performance declines as climatic conditions become colder and the temperature of the reactor decreases. Performance during the colder weather months is generally not sufficient to meet water quality discharge goals.

In 2012, the west pond biocell was rehabilitated using the media mixture for a full scale test of the biological media. Monitoring of the performance of the biocell has continued. It should be noted that flows from the seep pond routinely exceeded the design capacity of the biocell, and consequently, zinc removal efficiency declined during the periods of high flow.

The planned additional stormwater runoff control measures have the potential to substantially reduce the flow rate and concentration of the water entering the seep pond. Given the current concentration of the zinc in the water entering the seep pond, maximizing reductions in flow rate and concentration through source control are key to consistently meeting water quality discharge goals.

3.0 Schedule

An exact starting date for this project is not given. Instead, the starting date is predicated upon the approval of this document. Table 1 provides a list of tasks to be completed. The sequence of the tasks shown was not provided to show the exact order of work. The exact order will be determined as construction activities progress and will be based on a multitude of factors including, but not limited to, the type of equipment needed for given tasks, logistical issues, the weather, and unforeseen existing conditions.

The grouping of tasks and the amount of time estimated to accomplish the tasks is strictly for showing the estimated length of time it will take to complete these activities. The list was given an approximate start time for each group of tasks as it related to the approval of the RAWP. In addition, an estimated number of weeks to complete each group of tasks was approximated. The actual number of weeks to complete a given task may vary based on conditions encountered during the completion of the task. While the assumed amount of time needed to complete each task may vary, it is believed that the total length of time needed to complete these activities is relatively accurate. The schedule was developed using the following assumptions:

During construction, multiple tasks may be worked on simultaneously.

The application of rock and cover soil will be completed as regrading activities are finished.

Vegetation activities will be completed as soon as cover soil has been placed and seasonal conditions are appropriate.

Subsequent vegetation activities will be completed as part of the post-removal site control activities, which will focus on the long-term care and maintenance of the vegetation initially established.

These activities will be completed using a core equipment fleet that consists of the following:

(2) Excavators

(2) Komatsu D65 bulldozers or equivalent

(1) Skid steer

(4) Volvo articulated dump trucks or equivalent

(1) Articulated water truck

Additional "specialized" equipment will be brought onsite to complete specific tasks as needed.

The Doe Run remediation crew will be maintained at its current size of five people. A typical work week will be approximately 40 hours per week, which will be completed utilizing a four-day per week schedule.

Table 1 Proposed Construction Schedule

Activity	Start Date	Completion Date
Mobilization – Including moving facilities and equipment to the site.		2 weeks
Clearing and grubbing vegetation from work area in Upper Tailings Area.	As soon as SMP is approved.	3 weeks after start of task
Construct and cover swale and berm in Upper Tailings Area.	Upon completion of clearing and grubbing.	6 weeks after start of task
Demolish the portion of the North Decant Tower above the existing grade.	Upon completion of grading.	1 week after start of task
Plug the North Decant Tower.	Upon completion of demolition activities.	2 weeks after start of task
Construct low flow swale through south LBMOA detention pond.	Upon completion of work on the Upper Tailings Area.	4 weeks after start of task
Cover the low flow swale and surrounding portions of the LBMOA detention pond.	Upon completion of grading activities for low flow swale.	3 weeks after start of task
Remove existing HDPE pipe from Lower Tailings Area discharge structure.	Upon completion of work in the south LBMOA detention pond.	1 week after start of task
Place new CPP pipe from Lower Tailings Area discharge structure.	Upon completion of work to remove the HDPE pipe.	2 weeks after start of task
Construct and cover berm downstream of new CPP pipe discharge.	Upon completion of work to install the CPP pipe.	2 weeks after start of task
Vegetate area where soil was placed.	Upon completion of all other activities.	1 weeks after start of task
Total Time for Completion		**27 Weeks**

4.0 Summary/Conclusion

Doe Run has implemented measures over the last several years, described in Section 1.0, that were primarily done to stabilize the site and prevent losses of tailings/chat from the piles. Some of the removal action activities had a long-term effect of improving water quality, but the primary purpose was the minimization of offsite tailings/chat losses.

The actions identified in Section 2.0 of this plan are specifically intended to improve stormwater management by the reduction of run-on and reduction of percolation precipitation/run-on through the tailings/chat. By reducing water percolating through the tailings/chat, Doe Run anticipates that less seepage will be generated and consequently less mass of metals released from tailings/chat.

Doe Run anticipates monitoring the effect of the impact of the actions throughout the year on seepage production and monitoring the removal performance of the biocells to continue to document and determine what, if any, additional treatment will needed to meet water quality goals.

5.0 References

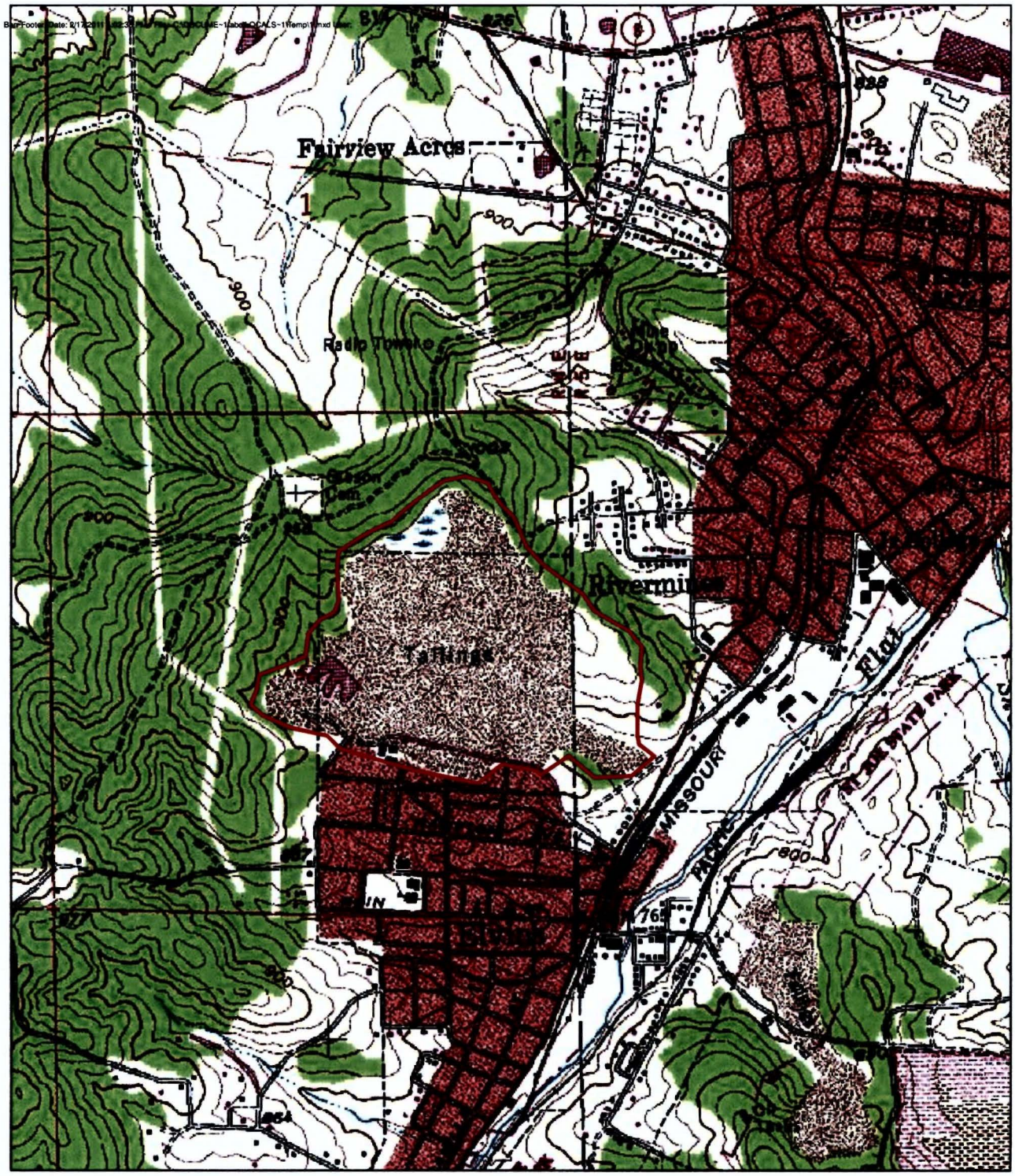
Barr Engineering Co., 2005a. *First Revision, Removal Action Workplan, Elvins/Rivermines Mine Tailings Site, Park Hills, Missouri,* Prepared for The Doe Run Company, July 2005.

Barr Engineering Co., 2005b. Construction Drawings, Elvins/Rivermines Mine Tailings Site Removal Action, May 2005.

Barr Engineering Co., 2005c. *Specification, Elvins/Rivermines Mine Tailings Site, Park Hills, Missouri,* Prepared for The Doe Run Company, July 2005.

Barr Engineering Co., 2003. *Second Revision, Engineering Evaluation/Cost Analysis Report, Elvins/Rivermines Mine Tailings Site, Park Hills, Missouri,* Prepared for The Doe Run Company, June 2003.

Figures



Legend

Site Outline

Feet
0 500 1,000 1,500 2,000

Meters
0 200 400 600 800

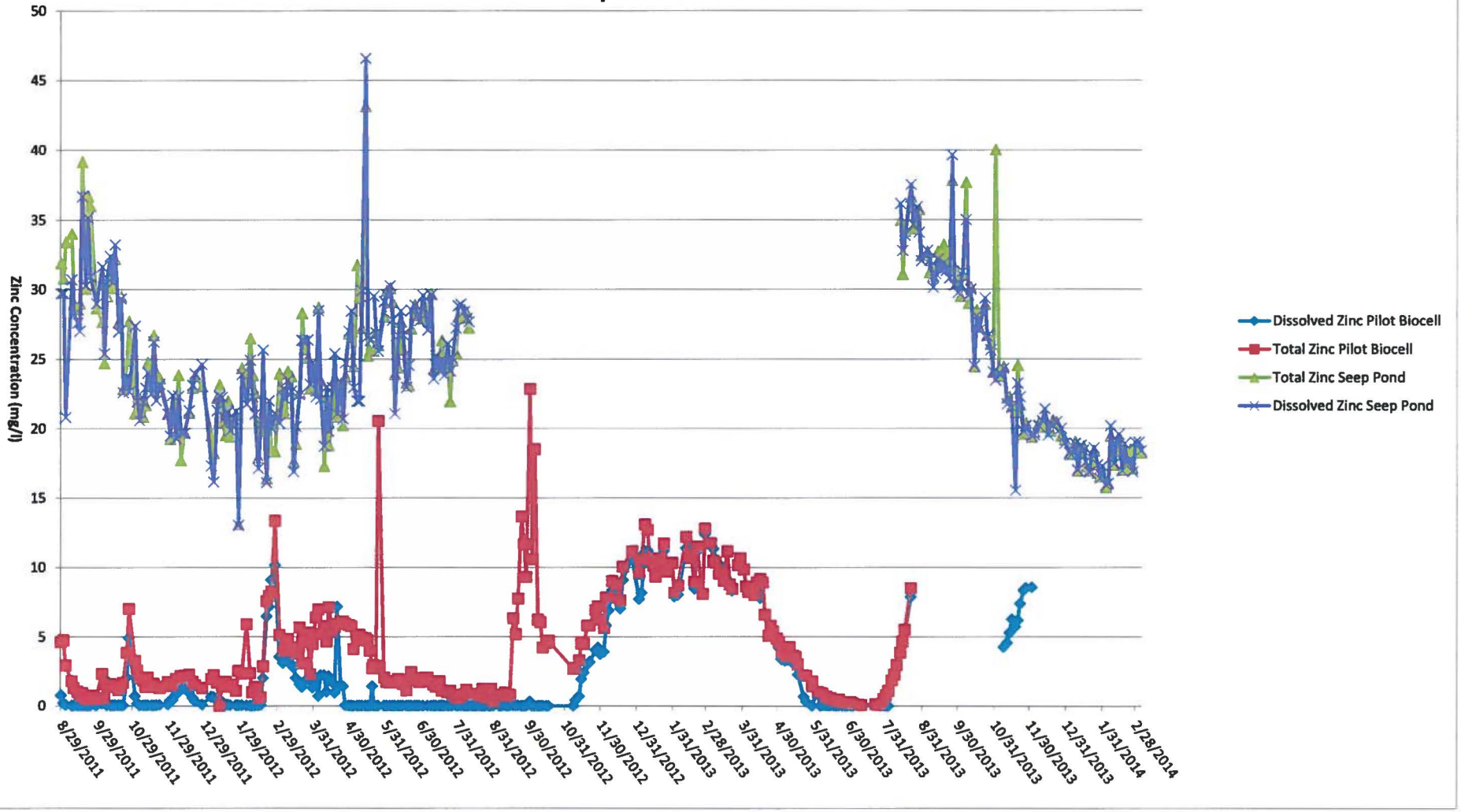
BARR

Figure 1

Location Map
Rivermines Mine Tailings Basin
The Doe Run Company
St. Louis, Missouri

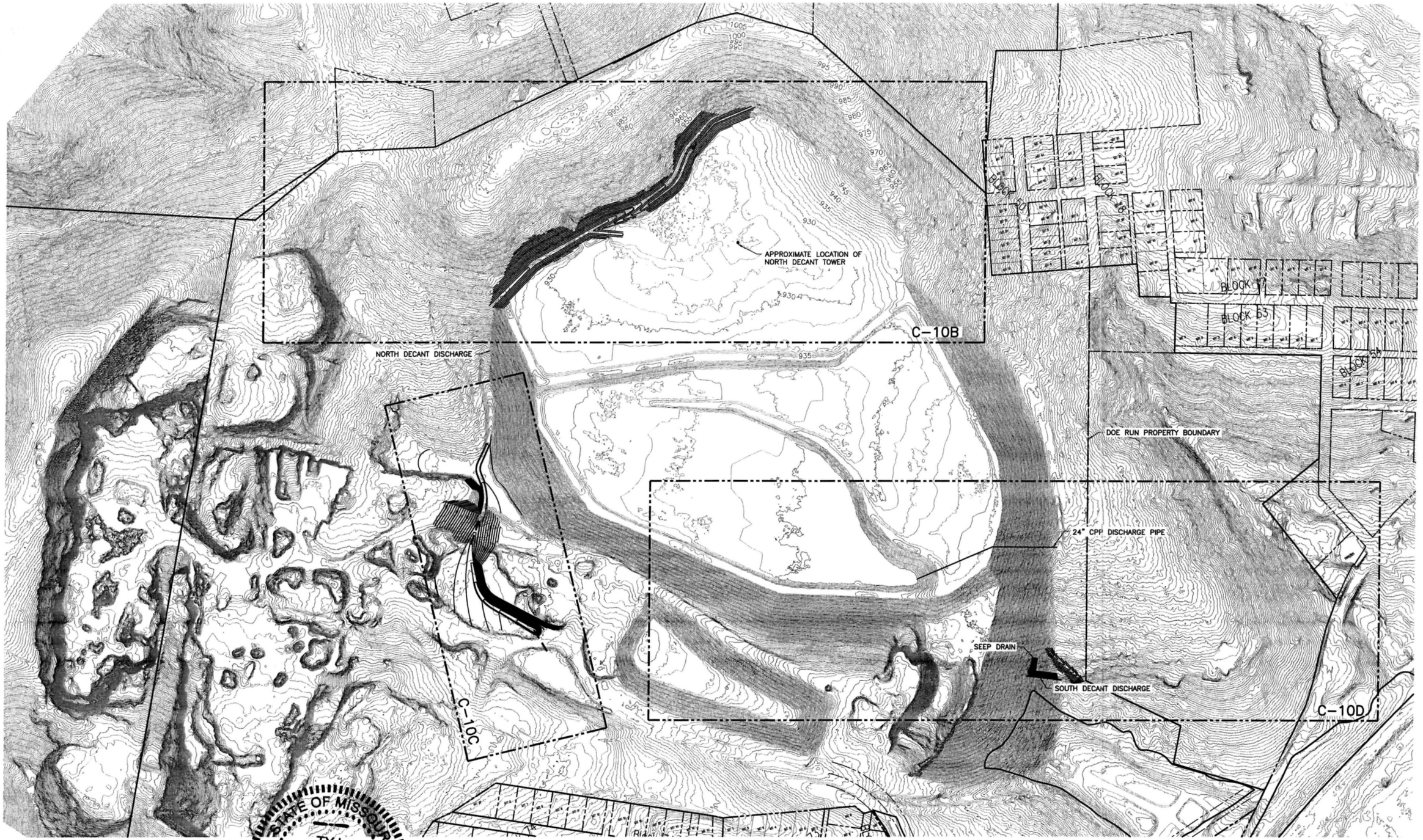
Figure 2

Total and Dissolved Zinc Concentration of Seep Pond vs Pilot Scale Biocell Effluent



Appendix A

Construction Drawings



NOTES:
1. EXISTING CONTOURS ARE FROM AN AERIAL LIDAR SURVEY COMPLETED BY SURDEX CORPORATION FOR ST. FRANCOIS COUNTY ON 2/2/12 AFTER REMOVAL ACTION ACTIVITIES WERE COMPLETED.
2. AREAS OF NATURAL GROUND THAT ARE DISTURBED OR AREAS COVERED WITH COVER SOIL WILL BE SEEDED AND FERTILIZED IN ACCORDANCE WITH APPROVED PLANTING

STATE OF MISSOURI
TY L. MORRIS
NUMBER E-2002003210
REGISTERED PROFESSIONAL ENGINEER
1/12/15

0 200 400
SCALE IN FEET

NO.	BY	CHK.	APP.	DATE	REVISION DESCRIPTION

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BID		1/12/15							
CONSTRUCTION		1/12/15							
EPA	9/19/14	1/12/15							
RELEASED TO/FOR	A	B	C	0	1	2	3		
	DATE RELEASED								

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Date	03/21/14
Drawn	CMS2
Checked	TLM
Designed	TLM
Approved	TLM

THE DOE RUN COMPANY

ELVINS/RIVERMINES REMOVAL ACTION
PARK HILLS, MISSOURI
SURFACE WATER MANAGEMENT TAILINGS AREA

BARR PROJECT No.	25/86-009-TLM
CLIENT PROJECT No.	
DWG. No.	C-10A
REV. No.	B

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NOTES:
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2. THE FINAL ALIGNMENT, LENGTH, AND BOTTOM ELEVATION OF THE SWALE BEING CONSTRUCTED TO DRAIN THE POND WILL BE DETERMINED DURING COMPLETION OF THE WORK BASED ON THE CONDITIONS ENCOUNTERED IN THE FIELD.
3. DEMOLISH PORTION OF EXISTING DECANT TOWER FLUSH WITH GROUND SURFACE. FILL BOTTOM 3 FEET WITH QUARRY ROCK AND THEN FILL WITH A MINIMUM OF 10 FEET OF CONCRETE. THE REMAINDER OF TOWER WILL BE FILLED WITH LOW PERMEABILITY SOIL AND BLENDED INTO CONTOURS OF SURROUNDING GROUND.
4. DESIGN CONTOURS SHOWN ARE FINAL GRADE.
5. AREAS OF NATURAL GROUND THAT ARE DISTURBED OR AREAS COVERED WITH COVER SOIL WILL BE SEEDED AND FERTILIZED IN ACCORDANCE WITH APPROVED SEEDING SPECIFICATION.
6. VEGETATION CLEARED AND GRUBBED DURING THE CONSTRUCTION OF THE DRAINAGE SWALE WILL BE BURNED.

EXTEND SWALE AS NEEDED TO DRAIN POND SEE NOTE 2

APPROXIMATE LOCATION OF NORTH DECANT TOWER TO BE DEMOLISHED SEE NOTE 3

1 PLAN: UPPER TERRACE DRAINAGE SWALE
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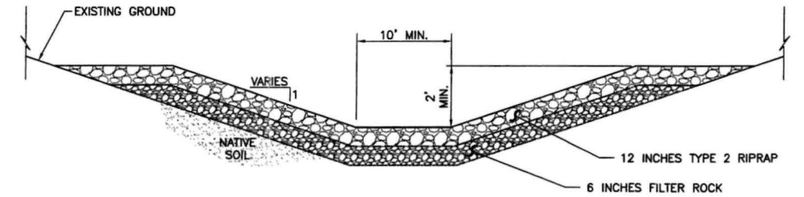

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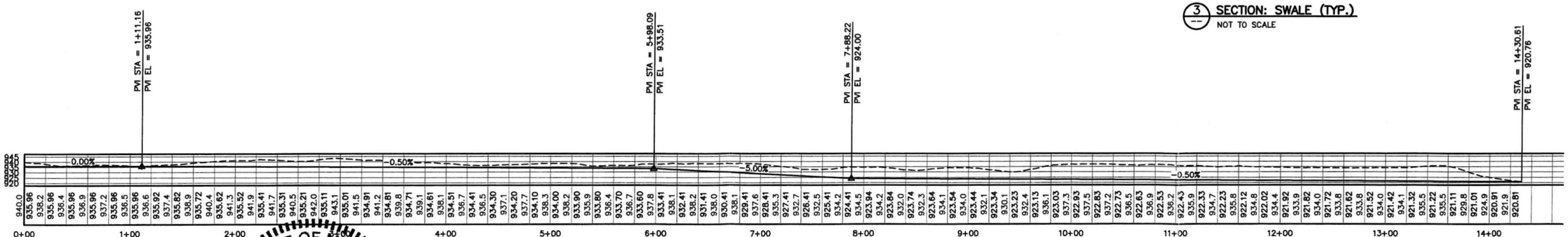

2 PROFILE: UPPER TERRACE DRAINAGE SWALE

STATE OF MISSOURI
TY L. MORRIS
NUMBER E-2002003210
REGISTERED PROFESSIONAL ENGINEER
1/12/15

NO.	BY	CHK.	APP.	DATE	REVISION DESCRIPTION

CLIENT	5/26/14								
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CONSTRUCTION								1/12/15	
EPA								10/10/14	1/12/15
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Date	5/9/14
Drawn	CMS2
Checked	TLM
Designed	TLM
Approved	TLM

THE DOE RUN COMPANY

ELVINS/RIVERMINES REMOVAL ACTION
PARK HILLS, MISSOURI

SURFACE WATER MANAGEMENT
UPPER TAILINGS AREA DRAINAGE SWALE

BARR PROJECT No. 25/86-009 TLM
CLIENT PROJECT No.
DWG. No. C-10B
REV. No. B

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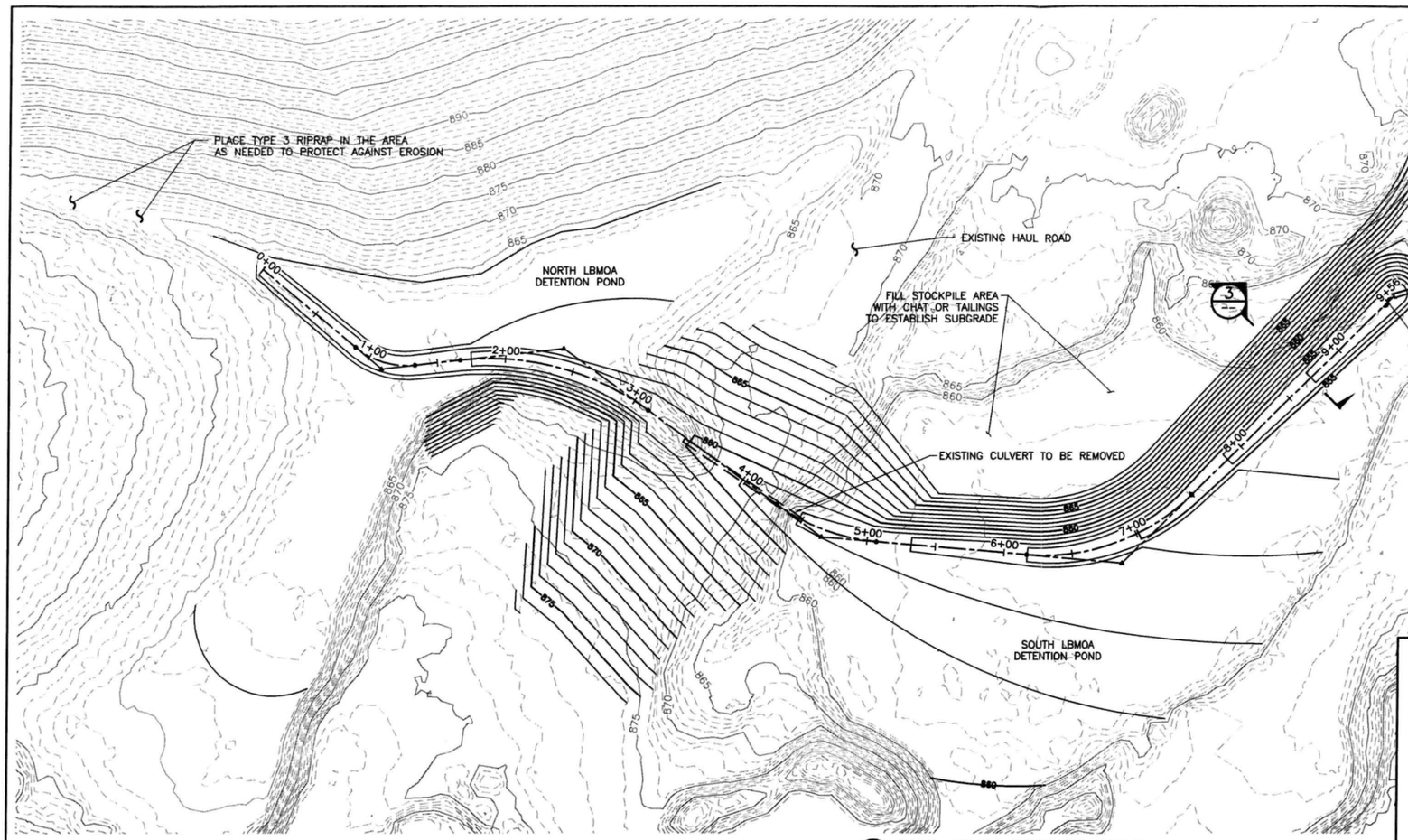

NOTES:
1. EXISTING CONTOURS ARE FROM AN AERIAL LIDAR SURVEY COMPLETED BY SURDEX CORPORATION FOR ST. FRANCOIS COUNTY ON 2/2/12 AFTER REMOVAL ACTION ACTIVITIES WERE COMPLETED.
2. MODIFICATIONS TO THE HAUL ROAD, STOCKPILE AREA, AND POND WILL BE COORDINATED WITH LEAD BELT MATERIALS INC.
3. THE FINAL ALIGNMENT AND BOTTOM ELEVATION OF THE SWALE WILL BE DETERMINED DURING THE COMPLETION OF THE WORK BASED ON THE LOCATION AND ELEVATION OF THE EXISTING CULVERT.
4. DESIGN CONTOURS SHOWN ARE SUBGRADE CONTOURS.

1 PLAN: LBMOA DRAINAGE SWALE
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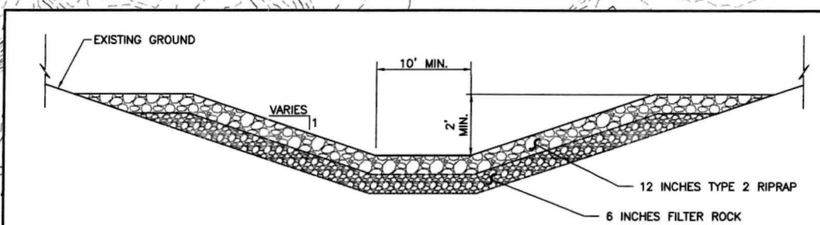

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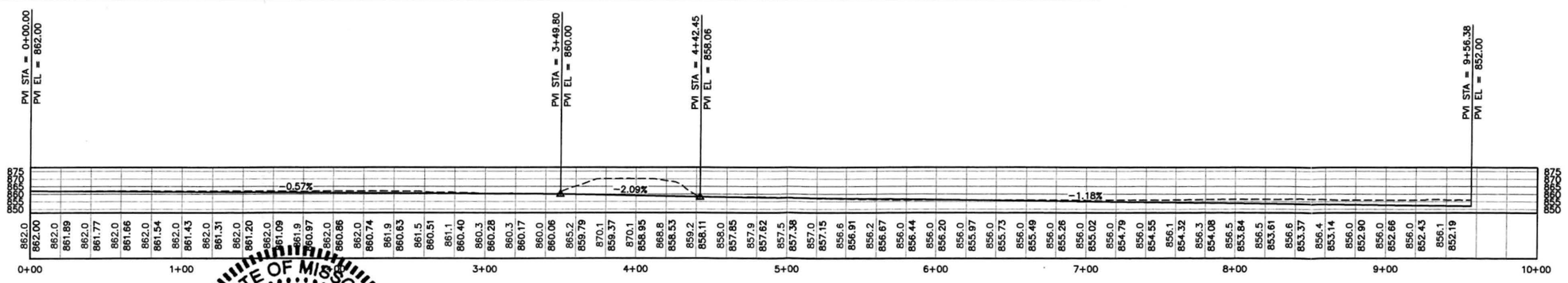

2 PROFILE: LBMOA DRAINAGE SWALE

STATE OF MISSOURI
TY L. MORRIS
NUMBER E-2002003210
REGISTERED PROFESSIONAL ENGINEER
1/12/15

NO.	BY	CHK.	APP.	DATE	REVISION DESCRIPTION

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Date	5/9/14
Drawn	CMS2
Checked	TLM
Designed	TLM
Approved	TLM

THE DOE RUN COMPANY

ELVINS/RIVERMINES REMOVAL ACTION
PARK HILLS, MISSOURI

SURFACE WATER MANAGEMENT
LBMOA DRAINAGE SWALE

BARR PROJECT No. 25/86-009 TLM
CLIENT PROJECT No.
DWG. No. C-10C
REV. No. B

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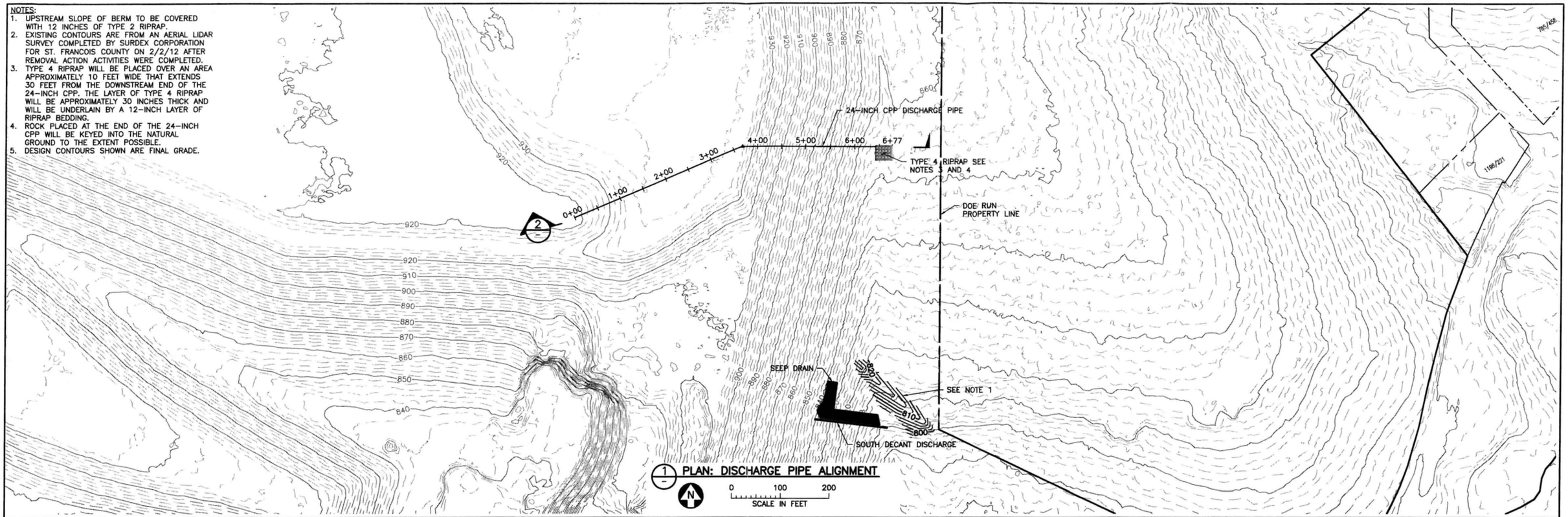
NOTES:
1. UPSTREAM SLOPE OF BERM TO BE COVERED WITH 12 INCHES OF TYPE 2 RIPRAP.
2. EXISTING CONTOURS ARE FROM AN AERIAL LIDAR SURVEY COMPLETED BY SURDEX CORPORATION FOR ST. FRANCOIS COUNTY ON 2/2/12 AFTER REMOVAL ACTION ACTIVITIES WERE COMPLETED.
3. TYPE 4 RIPRAP WILL BE PLACED OVER AN AREA APPROXIMATELY 10 FEET WIDE THAT EXTENDS 30 FEET FROM THE DOWNSTREAM END OF THE 24-INCH CPP. THE LAYER OF TYPE 4 RIPRAP WILL BE APPROXIMATELY 30 INCHES THICK AND WILL BE UNDERLAIN BY A 12-INCH LAYER OF RIPRAP BEDDING.
4. ROCK PLACED AT THE END OF THE 24-INCH CPP WILL BE KEYED INTO THE NATURAL GROUND TO THE EXTENT POSSIBLE.
5. DESIGN CONTOURS SHOWN ARE FINAL GRADE.



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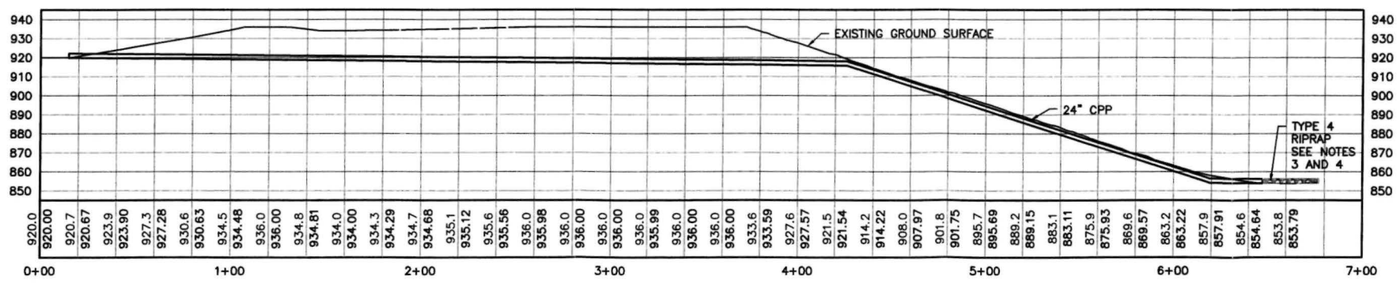

2 PROFILE: DISCHARGE PIPE ALIGNMENT

STATE OF MISSOURI
TY L. MORRIS
NUMBER E-2002003210
REGISTERED PROFESSIONAL ENGINEER
1/12/15

NO.	BY	CHK.	APP.	DATE	REVISION DESCRIPTION

CLIENT	9/26/14	—	—	—	—	—	—	—	—
BID	—	—	—	—	—	—	—	—	—
CONSTRUCTION	—	1/12/15	—	—	—	—	—	—	—
EPA	10/10/14	1/12/15	—	—	—	—	—	—	—
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RELEASED TO/FOR	A	B	C	0	1	2	3		
	DATE RELEASED								

BARR
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1001 DIAMOND RIDGE
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Scale	AS SHOWN
Date	03/21/14
Drawn	CMS2
Checked	TLM
Designed	TLM
Approved	TLM

THE DOE RUN COMPANY

ELVINS/RIVERMINES REMOVAL ACTION
PARK HILLS, MISSOURI

SURFACE WATER MANAGEMENT
LOWER TAILINGS AREA DISCHARGE PIPE

BARR PROJECT No. 25/86-009-TLM
CLIENT PROJECT No.
DWG. No. C-10D
REV. No. B